United States Patent Application

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for

**SYSTEM AND METHOD FOR CARRYING OUT
AND MONITORING BIOLOGICAL PROCESSES**

PROGRAMMING CODE APPENDIX A

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NEW
1      GOTO 60:REM                              ***I/O stepper (I=$(0), O=z(72))***
3      IF (XBY(65507).AND.64)=0 THEN Z(0)=XBY(65506) :  GOTO 3
4      DO  :  WHILE (XBY(65507).AND.128)=128
5      I=0 :  DO : I=I+1 : XBY(65506)=ASC($(0),I)
6      WHILE ASC($(0),I)<>13 :  RETURN
7      DO  : WHILE (XBY(65507).AND.64)=64
8      I=0 :  DO  : Z(I)=XBY(65506)
9      I=I+1 : UNTIL Z(I-1)=32 :  RETURN

10     REM      ***error check***
15     IF TX<0 THEN TX=0
16     RETURN
20     IF TX<-251 THEN TX=-251
21     RETURN
25     IF TX>251 THEN TX=251
26     RETURN

30     GOSUB 50:TP1=TP:T1=TIME
32     DO:UNTIL TIME>T1+0.2
34     GOSUB 50:TP2=TP:T2=TIME
36     SL=(TP2-TP1)/(T2-T1):IF SL<>0 THEN IT=(TG-TP2)/SL
38     PRINT USING(###.##),'SL=',SL,'IT=',IT,'AT TEMP=',TP2
40     IF IT>1 GOTO 30
42     RETURN

49     REM         ***temperature measurement***
50     E=XBY(65504):F=XBY(65505):G=XBY(65504):TP=(F*256+G+300)/38.3:  RETURN

60     CLEAR  :  STRING 150,72 :  DIM Z(72)
72     DTEMP=95:DTIM=1:DS=10
74     ATEMP=60:ATIM=1:AS=20
76     ETEMP=74:ETIM=15:ES=1:CYCLE=100
80     PRINT USING(###),'#',TAB (20),'TEMP',TAB (30),'TIME',TAB (40),'SLOPE'
82     PRINT '1) DENATURATION', TAB(30),DTEMP,TAB(30),DTIM,TAB(40),DS
84     PRINT '2) ANNEALING',TAB(20),ATEMP,TAB(30),ATIM,TAB(40),AS
86     PRINT '3) EXTENSION',TAB(20),ETEMP,TAB(30),ETIM,TAB(40),ES
88     PRINT '4) CYCLES       ',CYCLE:PRINT
110    INPUT 'TYPE # TO CHANGE OR 0 IF OK (CHOICES ARE 0,1,2,3, OR 4)?',J
114    IF J=0 THEN GOTO 170
116    ON J GOSUB ,120,130,150,160
118    PRINT:GOTO 80
120    INPUT 'ENTER DENATURATION Temp, Time, Slope: ',DTEMP,DTIM,DS
125    IF DTEMP>98 GOTO 120
126    RETURN
130    INPUT 'ENTER ANNEALING Temp, Time, Slope: ',ATEMP,ATIM,AS
140    IF AS<0 GOTO 130
142    IF AS>21 GOTO 130
145    RETURN
150    INPUT 'ENTER EXTENSION Temp, Time, Slope: ',ETEMP,ETIM,ES:RETURN
160    INPUT 'ENTER Number of Cycles:',CYCLE:RETURN
170    $(0)='msrl 500;spl 200;hfl 2;=tl 1;esr' :  GOSUB 3 :  GOSUB 7
175    FOR I=0 TO 10 :  PRINT CHR(Z(I)), : NEXT I :  PRINT

200    $(0)='gol nd;hfl 2;wfo =.x..;sl':GOSUB 3;           rem open
210    PRINT 'WAIT FOR COOLING':XBY(65504)=3
220    DO  :  GOSUB 50 :  UNTIL TP<45
230    PRINT 'TEMP=',TP,' LOAD SAMPLES AND THEN PRESS A KEY'
240    W=GET :  IF W=0 GOTO 240

300    TMC=0 :WS=0:  CLOCK 0 : TIME=0 : DBY(71)=0 :  CLOCK 1
305    $(0)='hfl 1;spl 100;gol;wfo =x...;sl':GOSUB 3;           REM CLOSE
310    FOR V=1 TO CYCLE
315    PRINT 'D', : TG=DTEMP:XBY(65509)=4:IF V=1 THEN TG=DTEMP+(DS/4)
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320    WS=(DS*10+WS*9)/10:TX=INT(WS+0.5):GOSUB 15
325    XBY(65508)=TX:GOSUB 50:IF TP>TG GOTO 340
330    IF TX<>DS*10 GOTO 320
333    GOSUB 30
335    GOSUB 50:IF TP<TG GOTO 335
340    TG=DTEMP:EB=TIME
345    WS=(5*WS+10*(TG-TP))/7 :TX=INT(WS+0.5)
350    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
355    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
360    IF V=1 THEN IF DTIM+5>(TIME-EB) GOTO 380
370    IF DTIM<(TIME-EB) GOTO 500
380    GOSUB 50 :  GOTO 345

500    PRINT 'A',:XBY(65508)=0:TG=ATEMP
845    $(0)='spl 200;gol nd;hfl 2;wfo =.x..;sl':GOSUB 3:          rem open
855    XBY(65509)=AS*10
860    GOSUB 30
890    EB=TIME:WS=-AS*10
913    WS=(4*WS+20*(TG-TP))/5:TX=INT(WS+0.5)
915    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
918    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
920    IF ATIM+1<(TIME-EB) GOTO 925
924    GOSUB 50 :  GOTO 913

925    PRINT:PRINT 'E ',:XBY(65509)=4:TG=ETEMP+1
930    $(0)='hfl 1;spl 50;gol;wfo =x...;sl':GOSUB 3:WS=0:  REM CLOSE
935    WS=(ES*10+WS*9)/10:TX=INT(WS+0.5):GOSUB 15:GOSUB 25:XBY(65508)=TX
937    GOSUB 50:IF TP>TG-1 GOTO 970
940    IF TX<>ES*10 GOTO 935
950    GOSUB 50 :  IF TP<TG-1 GOTO 950
970    EB=TIME
980    WS=(WS+5*(TG-TP))/3 :TX=INT(WS+0.5)
983    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
987    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
990    IF ETIM<(TIME-EB) GOTO 1000
995    GOSUB 50 :  GOTO 980
1000   CTIM=TIME-TMC : TMC=TIME :  PRINT 'CYCLE=',V,'TIME=',CTIM
1050   NEXT V

1055   XBY(65508)=0:XBY(65509)=255
1060    INPUT 'STRAND REANNEALING (Y/N) ?',$(1)
1070    IF ASC($(1),1)=78 GOTO 1390
1100   PRINT 'STRAND REANNEALING IN PROCESS...'
1110    TG=DTEMP:XBY(65509)=4
1120    WS=(DS*10+WS*9)/10:TX=INT(WS+0.5):GOSUB 15
1130   XBY(65508)=TX:GOSUB 50:IF TP>TG GOTO 1170
1140   IF TX<>DS*10 GOTO 1120
1150   GOSUB 30
1160   GOSUB 50:IF TP<TG GOTO 1160
1170   EB=TIME
1180   WS=(11*WS+10*(TG-TP))/12 :TX=INT(WS+0.5)
1185    IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
1190    IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
1193    IF 5<(TIME-EB) GOTO 1200
1196    GOSUB 50 :  GOTO 1180
1200   XBY(65508)=0:XBY(65509)=255:WS=0
1210   DO:GOSUB 50:UNTIL TP<75

1220   EB=TIME
1230   WS=(WS+5*(75-TP))/3 :TX=INT(WS+0.5)
1240   IF TX>=0 THEN GOSUB 25:XBY(65508)=TX:XBY(65509)=4
1250   IF TX<0 THEN GOSUB 20:XBY(65508)=0:XBY(65509)=4-TX
1260    IF 60<(TIME-EB) GOTO 1280
1270    GOSUB 50 :  GOTO 1230
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1280    XBY(65508)=0:XBY(65509)=255
1290     INPUT 'ANOTHER RUN (Y/N) ?',$(1)
1300     IF ASC($(1),1)=78 GOTO 2000
1400     PRINT:$(0)='go1 nd;hf1 9;wfo =.x..;s1':GOSUB 3:GOTO 80
2000    $(0)='go1 nd;hf1 9;wfo =.x..;s1':GOSUB 3:END
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